

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

RULE 4311 - FLARES

(Adopted June 20, 2002; Amended June 15, 2006)

1.0 Purpose

The purpose of this rule is to limit the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) from the operation of flares.

2.0 Applicability

This rule is applicable to operations involving the use of flares.

3.0 Definitions

3.1 Air-Assisted Flare: a combustion device where forced air is injected to promote turbulence for mixing and to provide combustion air.

3.2 Air Pollution Control Officer (APCO): as defined in Rule 1020 (Definitions).

3.3 Air Resources Board (ARB or CARB): as defined in Rule 1020 (Definitions).

3.4 Coanda Effect Flare: A flare in which the high pressure flare gas flows along a curved surface inspirating air into the gas to promote combustion.

3.5 Emergency: any situation or a condition arising from a sudden and reasonably unforeseeable event beyond the control of the operator. An emergency situation requires immediate corrective action to restore safe operation. A planned flaring event shall not be considered as an emergency.

3.6 Enclosed Flare: a flare composed of multiple gas burners that are grouped in an enclosure, and are staged to operate at a wide range of flow rates.

3.7 Flare: a direct combustion device in which air and all combustible gases react at the burner with the objective of complete and instantaneous oxidation of the combustible gases. Flares are used either continuously or intermittently and are not equipped with devices for fuel-air mix control or for temperature control.

3.8 Flare Gas: gas burned in a flare.

3.9 Gaseous Fuel: any gases used as combustion fuel which include, but are not limited to, any natural, process, synthetic, landfill, sewage digester, or waste gases. Gaseous fuel includes produced gas, pilot gas and, when burned, purge gas.

- 3.10 Non-Assisted Flare: a combustion device without any auxiliary provision for enhancing the mixing of air into its flame. This definition does not include those flares, that by design, provide excess air at the flare tip.
- 3.11 NOx: any nitrogen oxide compounds
- 3.12 Open Flare: a vertically or horizontally oriented open pipe flare from which gases are released into the air before combustion is commenced.
- 3.13 Planned Flaring: a flaring operation that constitutes a designed and planned process at a source, and which would have been reasonably foreseen ahead of its actual occurrence, or is scheduled to occur. The operation of a flare for the purpose of performing equipment maintenance provided it does not exceed 200 hours per calendar year, or during compliance source testing or visible emission inspections is not considered planned flaring. Planned flaring includes, but is not limited to, the following flaring activities:
- 3.13.1 Oil or gas well tests, well related work, tests ordered by a regulatory agency.
 - 3.13.2 Equipment depressurization for maintenance purposes.
 - 3.13.3 Equipment start-up or shutdown.
 - 3.13.4 Flaring of gas at production sources where no gas handling, gas injection or gas transmission facilities exists.
 - 3.13.5 Flaring of off-specification gas (i.e. non PUC quality gas), unless the operator can demonstrate that the gas must be flared for engineering or safety reasons, e.g., under emergency.
- 3.14 Public Utilities Commission (PUC) Quality Gas: any gaseous fuel, gas containing fuel where the sulfur content is no more than one-fourth (0.25) grain of hydrogen sulfide per one hundred (100) standard cubic feet and no more than five grains of total sulfur per one hundred (100) standard cubic feet. PUC quality gas shall also mean high methane (at least 80 % by volume) gas as specified in PUC's General Order 58-A.
- 3.15 Purge Gas: Nitrogen, carbon dioxide, liquefied petroleum gas, or natural gas, any of which can be used to maintain a non-explosive mixture of gases in the flare header or provide sufficient exit velocity to prevent any regressive flame travel back into the flare header.
- 3.16 Steam-Assisted Flare: a combustion device where steam is injected into the combustion zone to promote turbulence for the mixing of the combustion air before it is introduced to the flame.

- 3.17 Total Organic Gases: all hydrocarbon compounds containing hydrogen and carbon with or without other chemical elements.
- 3.18 U.S. EPA: the United States Environmental Protection Agency.
- 3.19 Volatile Organic Compound (VOC): as defined in Rule 1020 (Definitions).

4.0 Exemptions

- 4.1 Flares operated in municipal solid waste landfills subject to the requirements of Rule 4642 (Solid Waste Disposal Sites) are exempt from this rule.
- 4.2 Flares that are subject to the requirements of 40 CFR 60 Subpart WWW (Standards of Performance for Municipal Waste Landfills), or Subpart Cc (Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills) are exempt from this rule.
- 4.3 Except for the recordkeeping requirements in Section 6.2.4, the requirements of this rule shall not apply to any stationary source that has the potential to emit, for all processes, less than ten (10.0) tons per year of VOC and less than ten (10.0) tons per year of NO_x.

5.0 Requirements

The owner or operator of any source subject to this rule shall comply with the following requirements:

- 5.1 Flares that are permitted to operate only during an emergency are not subject to the requirements of Sections 5.6 and 5.7.
- 5.2 The flame shall be present at all times when combustible gases are vented through the flare.
- 5.3 The outlet shall be equipped with an automatic ignition system, or, shall operate with a pilot flame present at all times when combustible gases are vented through the flare, except during purge periods for automatic-ignition equipped flares.
- 5.4 Except for flares equipped with a flow-sensing ignition system, a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting at least one pilot flame or the flare flame is present shall be installed and operated.
- 5.5 Flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot shall use purge gas for purging.

5.6 Open flares (air-assisted, steam-assisted, or non-assisted) in which the flare gas pressure is less than 5 psig shall be operated in such a manner that meets the provisions of 40 CFR 60.18. The requirements of this section shall not apply to Coanda effect flares.

5.7 Ground-level enclosed flares shall meet the following emission standards:

Type of Flare and Heat Release Rate in MMBtu/hr	VOC (lb/MMBtu)	NOx (lb/MMBtu)
Without Steam-assist		
<10 MMBtu	0.0051	0.0952
10-100 MMBtu	0.0027	0.1330
>100 MMBtu	0.0013	0.5240
With Steam-assist		
All	0.14 as TOG	0.068

6.0 Administrative Requirements

6.1 Compliance Determination

6.1.1 Upon request the operator of flares that are subject to Section 5.6 shall make available to the APCO the compliance determination records that demonstrate compliance with the provisions of 40 CFR 60.18, (c)(3) through (c)(5).

6.1.2 The operator of ground-level enclosed flares shall conduct source testing at least once every 12 months to demonstrate compliance with Section 5.7. The operator shall submit a copy of the testing protocol to the APCO at least 30 days in advance of the scheduled testing. The operator shall submit the source test results not later than 45 days after completion of the source testing.

6.2 Recordkeeping

The following records shall be maintained, retained on-site for a minimum of five years, and made available to the APCO, ARB, and U.S. EPA upon request:

6.2.1 Copy of the compliance determination conducted pursuant to Section 6.1.1.

6.2.2 Copy of the source testing result conducted pursuant to Section 6.1.2.

6.2.3 For flares used during an emergency, record of the duration of flare operation, amount of gas burned, and the nature of the emergency situation.

6.2.4 Beginning January 1, 2007, facilities claiming an exemption pursuant to Section 4.3 shall record annual throughput, material usage, or other information necessary to demonstrate an exemption under that section.

6.3 Test Methods

The test methods listed below shall be used to demonstrate compliance with this rule. Alternate equivalent test methods may be used provided the test methods have been approved by the APCO and EPA.

- 6.3.1 VOC, measured and calculated as carbon, shall be determined by EPA Method 25, except when the outlet concentration must be below 50 ppm in order to meet the standard, in which case Method 25a may be used, and analysis of halogenated exempt compounds shall be analyzed by EPA Method 18 or ARB Method 422 “Determination of Volatile organic Compounds in Emission from Stationary Sources”. The VOC concentration in ppmv shall be converted to pounds per million Btu (lb/MMBtu) by using the following equation:

$$\text{VOC in lb/MMBtu} = \frac{(\text{ppmv dry}) \times (F, \text{dscf} / \text{MMBtu})}{(1.135 \times 10^6) \times (20.9 - \%O_2)}$$

Where: F = As determined by EPA Method 19

- 6.3.2 NO_x emissions in pounds per million BTU shall be determined by using EPA Method 19.
- 6.3.3 NO_x and O₂ concentrations shall be determined by using EPA Method 3A, EPA Method 7E, or ARB 100.

7.0 Compliance Schedule

- 7.1 Flares at facilities with a potential to emit more than 25 tons per year of VOC or NO_x that are installed and in operation before June 20, 2002 shall be in compliance with this rule by December 20, 2003.
- 7.2 Flares, at facilities with a potential to emit more than 25 tons per year of VOCs or NO_x, that are installed or constructed on or after June 20, 2002, shall be in compliance with this rule upon initial operation and thereafter.
- 7.3 Flares that are installed before June 15, 2006 at facilities, which have the potential to emit between 10 tons per year and 25 tons per year of VOC or NO_x shall demonstrate compliance with this rule by January 1, 2008.
- 7.4 Flares, at facilities with a potential to emit between 10 tons per year and 25 tons per year of VOC or NO_x that are installed or constructed on or after June 15, 2006, shall be in compliance with this rule upon initial operation and thereafter.